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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/05/2001

Sadayuki Abeta

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09/28/2006

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EXAMINER

JAGANNATHAN, MELANIE

ART UNIT

PAPER NUMBER

2616

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/914,781	Applicant(s) ABETA ET AL.	
	Examiner Melanie Jagannathan	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE on 12/29/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

- A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/29/2005 has been entered.
- Claims 1-5 are pending.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-5 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claimed invention does not fall within at least one of the four categories of patent eligible subject matter recited in 35 U.S.C. 101 (process, machine, manufacture, or composition of matter). The claims are directed to a signal, per se. Please see Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, pages 55 and 57.

Claim Objections

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3. Claim 4 is objected to because of the following informalities: "the individual pilot symbol" should be changed to "user-specific pilot symbol". Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hakkinen et al. US 6,282,185 in view of Derryberry et al. US 6,728,307.

Regarding claim 1, the claimed multi-carrier CDMA transmission system is disclosed by OFDMA/CDMA radio system (Figure 1). The claimed aligns the

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reproduced data symbols along a frequency axis, multiplies the reproduced data symbols by a spreading code is disclosed by Hakkinen by signals are spread by multiplying each symbol pertaining to the data to be transmitted and comprising a bit or bit combination with a spreading code. See column 2, lines 58-67. The claimed performs multiplex transmission of data using a plurality of sub-carriers of different frequencies is disclosed by Hakkinen by transmitter modulates the transmission signals by subcarriers according to OFDMA. See column 2, lines 1-4, lines 45-52.

Hakkinen et al. discloses all of the limitations of the claim except for a pilot symbol for estimating a variation of channel and performing synchronous detection, the pilot symbol including a common pilot symbol for purpose of estimating a channel common to each user and a user-specific pilot symbol that performs communication in a channel different from the above described channel.

Derryberry et al. discloses a transmit diversity technique in CDMA forward link transmission utilizing a broadcast common pilot and a dedicated auxiliary pilot for each user. See column 2, lines 41-53.

At the time the invention was made it would have been obvious to modify the CDMA system of Hakkinen et al. with the transmit adaptive array common pilot and dedicated auxiliary pilot of Derryberry et al. One of ordinary skill in the art would be motivated to do so since it maximizes power received at the mobile station. See column 2, lines 30-33.

Regarding claim 2, the claimed all or some of the plurality of subcarriers used in signal transmission are used as subcarriers when spreading a symbol along a

frequency axis is disclosed by Hakkinen et al. in Figure 2 with subcarrier-hopping along frequency y-axis, the frequency of the modulating subcarrier of each spread-coded signal being changed in a predetermined manner. See column 4, 65-67, column 5, lines 1-5, lines 15-23.

Hakkinen et al. discloses all of the limitations of the claim except for the pilot symbol of claim 1.

Derryberry et al. discloses a transmit diversity technique in CDMA forward link transmission utilizing a broadcast common pilot and a dedicated auxiliary pilot for each user. See column 2, lines 41-53.

At the time the invention was made it would have been obvious to modify the spread coding of a transmission signal of Hakkinen et al. to include the transmit adaptive array common pilot and dedicated auxiliary pilot of Derryberry et al. One of ordinary skill in the art would be motivated to do so since it maximizes power received at the mobile station. See column 2, lines 30-33.

Regarding claim 3, the claimed symbols are orthogonal on the spread frequency axis and symbol sequences are orthogonal on a time axis is disclosed by Hakkinen in Figure 2 with subcarrier-hopping, the frequency of the modulating subcarrier of each spread-coded signal being changed in a predetermined manner. See column 4, 65-67, column 5, lines 1-5, lines 15-23. The subcarrier frequency hopping is implemented orthogonally by one carrier at a time. See Figure 2 (y-axis represents frequency and x-axis represents time).

Hakkinen et al. discloses all of the limitations of the claim except for the pilot symbol of claim 1.

Derryberry et al. discloses a transmit diversity technique in CDMA forward link transmission utilizing a broadcast common pilot and a dedicated auxiliary pilot for each user. See column 2, lines 41-53.

At the time the invention was made it would have been obvious to modify the spread coding of a transmission signal of Hakkinen et al. to include the transmit adaptive array common pilot and dedicated auxiliary pilot of Derryberry et al. One of ordinary skill in the art would be motivated to do so since it maximizes power received at the mobile station. See column 2, lines 30-33.

Allowable Subject Matter

6. Claims 4-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to overcome 35 U.S.C. 101 rejection and if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art of record does not disclose, in single or in combination, allotting some of the plurality of subcarriers used in signal transmission to pilot symbols discretely along the frequency axis and inserting a symbol sequence that multiplexes the common pilot symbol and the user-specific pilot symbol using a spreading signal in direction of the time axis.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

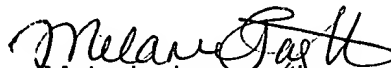
- Krauss et al. US 6,999,467.
- Li et al. US 6,904,283.
- Vandenmееle US 6,937,665.
- Jung et al. US 6,643,333.
- Engstrom et al. US 6,084,871.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Jagannathan whose telephone number is 571-272-3163. The examiner can normally be reached on Monday-Friday from 8:00 a.m.-5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Melanie Jagannathan
Patent Examiner
Art Unit 2616
September 25, 2006